liſh have many times found Relief by it. I don't underſtand, but that it may be practis'd at any Time of the Year, without Hazard or Inconvenience. The *Indians* often uſed it before, and after long Journies, Hunting or Voyages, to ſtrengthen and refreſh themſelves.

III. *An Attempt to account for the riſing and falling of the Water of ſome Ponds near the Sea, or ebbing and flowing Rivers; where the Water is loweſt in the Pond, at the Time of high Water in the Sea or River; and the Water is higheſt in the Pond, at the Time of low Water in the Sea or River. As alſo for the increaſing or decreaſing of the Water of ſuch Pools and Brooks as are higheſt in the dry Seaſons, and loweſt in the rainy Seaſons: With an Experiment to illuſtrate the Solution of the* Phænomena. *By the Reverend* J. T. Deſaguliers, *L. L. D. and R. S. S.*

HERO *Alexandrinus*, and other Hydraulick Writers, have deſcrib'd a Cup (call'd a *Tantalus*, from its Effect) which will hold any Liquor very well, when it is not fill'd above a certain Height mark'd in the Cup; but if it be fill'd higher, not only the Liquor above the Mark will run out, but the whole Liquor that was in the Cup. This is perform'd by a Syphon in the Cup, which is ſometimes conceal'd to make the Effect the more ſurpriſing.

The

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The Cup, AB (*Fig.* 1.) has a viſible Syphon CED in it; the Cup, (*Fig.* 2.) has the ſame, conceal'd by the Figure of a Man, to repreſent *Tantalus* in the Fable; and the Cup of *Fig.* 3. has its Syphon more conceal'd, as it is carried up into the Handle. Any of theſe Cups will hold Water very well, provided they are not fill'd up above the Line FG; for then not only the Liquor that is above FG will run out, but all the Liquor in the Cup as low as D, the Orifice of the ſhort Leg of the Syphon.

EXPERIMENT. Fig. 4.

In the Veſſel *a b c d* is plac'd an open wooden Box ABCD fill'd with Water as high as the Line LM. Another Box or Plug EFGH made tight, and containing Weights to ſink it, is made to let down into the Water between the Partition IK and the End AB of the Box above mention'd; but when it is not to preſs the Water up to IO, (as it does when let down) it is drawn out of the Water by the Weight *m*, which pulls it up by the Bar *i k* faſten'd to a Leaver moving round the Center *l*.

When, by means of the Plug, the Water in the Space ABKI is puſh'd up to IO, by paſſing under K; it runs out thro' the Spout PQ (whoſe Paſſage is gaged by a little Sluce P*p*) and falls into the Veſſel RS made of an oblong Figure like a Fiſh-Pond, and having a Syphon at S, ſo as to make it a *Tantalus*, or in the Nature of the Cups above mentioned.

Let the Weight *m* pull up the Plug EFGH, and the Water, having fill'd RS, will run down below the Orifice P to M.

The *Tantalus* RS, beginning to run out as ſoon as full, will for the Reaſons above given, continue to run till

till it is all emptied; and as it diſcharges it ſelf into another *Tantalus* T V (whoſe Syphon is at V); this laſt *Tantalus* will alſo, when full, begin to run out, and its Water go down to *x* Y *o*.

If the Plug be let down gradually, as ſoon as the Water begins to run out of the laſt *Tantalus* T V, (and the firſt *Tantalus* R S be cover'd ſo as to be conceal'd from Sight) it will appear to the Lookers on, That the Cavity T V, repreſenting a Pond near an ebbing and flowing River (as I am credibly inform'd there is ſuch an one at *Greenhive* in *Kent*, between *London* and *Graveſend*) always riſes, whilſt the Water at N O (or the Tide) falls to L M; and always ſinks whilſt the Water at L M (or the Tide) riſes to O L.

EXPERIMENT II.

Let the Water in the Box A B C D not be made uſe of; only the Veſſel Z be fill'd every half Hour: It will empty it ſelf in the Space of a Quarter of an Hour, falling like Rain, and dropping alſo thro' the Leaden Platform *e f* into the hidden *Tantalus* R S, which will not begin to run till this artificial Rain is over: Then in a Quarter of an Hour more, the *Tantalus* R S will have emptied it ſelf into the viſible *Tantalus* T V, which will be filling all the Time after Z has done running; (or in the dry Seaſon) and as ſoon as T V is full, it will begin to run out thro' its Syphon V, at the End of the half Hour, when the Veſſel Z or Sieve runs again; that is, at the Return of the rainy Seaſon.

This laſt Experiment may eaſily be applied to thoſe Ponds, or thoſe Brooks, that are high in dry Weather, and low in wet Weather; of which Kind, I am told, there is a Brook at *Lambourn* in *Berkſhire*.

If it be objected, that ſuch Ponds are full for ſome time, which a *Tantalus* cannot be, becauſe it begins to run out as ſoon as full; that may be eaſily ſolv'd, by ſuppoſing the hidden *Tantalus*, (or intermediate Cavity between the River and Pond) to contain more Water than the viſible one, provided it does not contain ſo much as not to be emptied, before the Return of the Tide.

The ſame Solution will ſerve for wet and dry Seaſons, only ſuppoſing the Cavities larger.

If it be asked, where the Water of the viſible *Tantalus*, near a River, can run; it may be anſwer'd, that all this may happen, tho' the ſecond, or loweſt *Tantalus* ſhou'd have its Bottom higher than low Water-Mark in the River. And for the Syphons, which are of a particular Make in the Cup; tho' ſuch be not ſuppos'd in the Earth, yet any long Paſſage, riſing in the Middle, will anſwer the End. See *Fig.* 5. where ABCD repreſents the Channel of a River, AD high Water-Mark, and GH low Water-Mark; ZI a Paſſage from the River to the Cavity IKLMN, or firſt, or hidden *Tantalus*; LMQ the Syphon of the firſt *Tantalus*, running into the ſecond *Tantalus*, or viſible Pond OQRP, which by its Syphon RSV runs out into low Grounds that may be above the low Water-Mark GH; and the Bottom KL of the firſt *Tantalus* may be above the Top of the laſt, whoſe Level is the Line WW.

ABCDYOQRPVH is the Section of the Surface of the Earth.

Fig. 1.

Fig. 2.

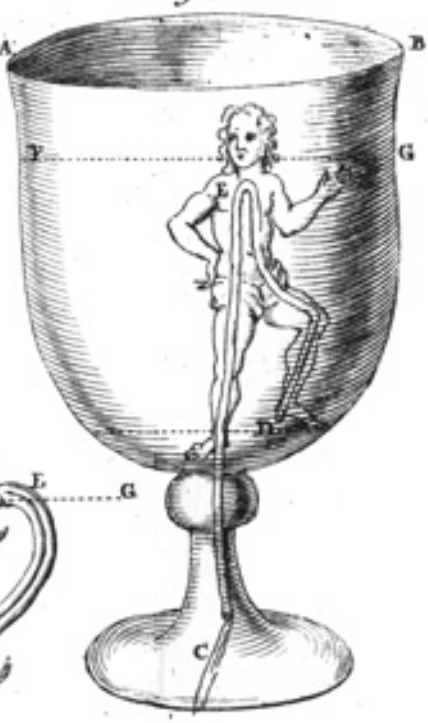


Fig. 3.

Fig. 4.

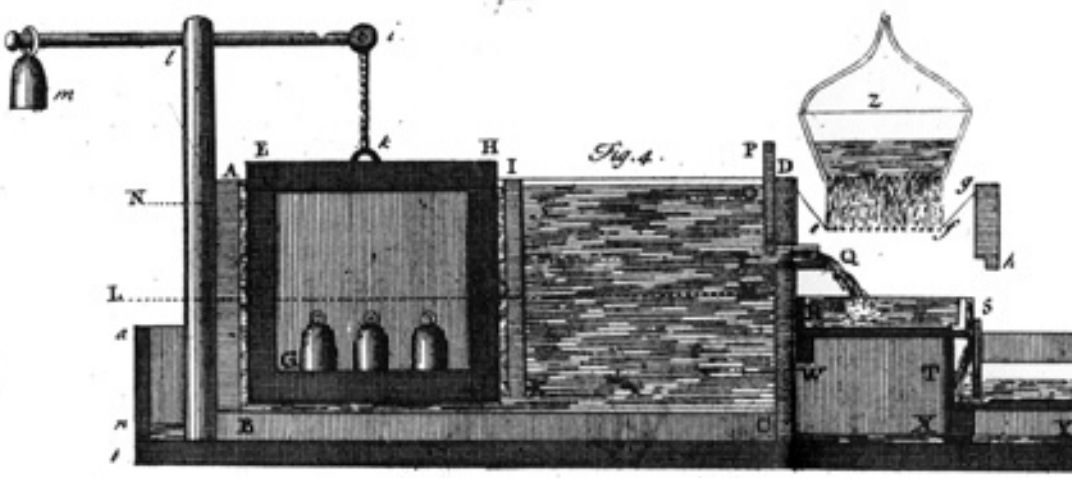
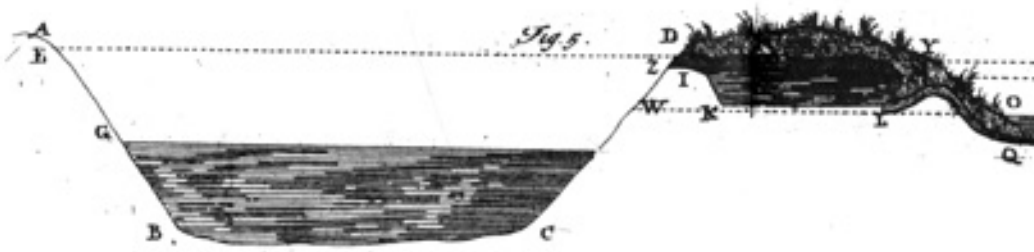
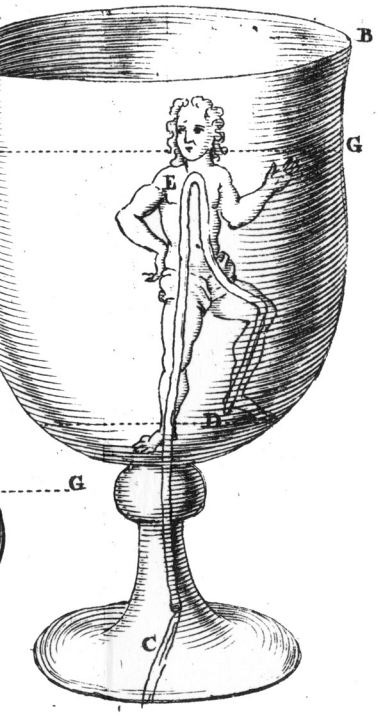


Fig. 5.





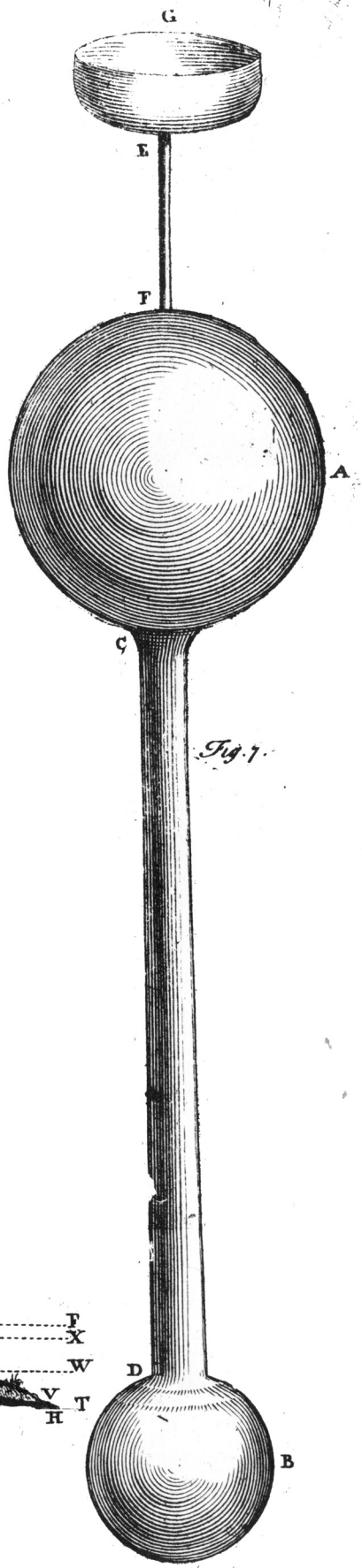
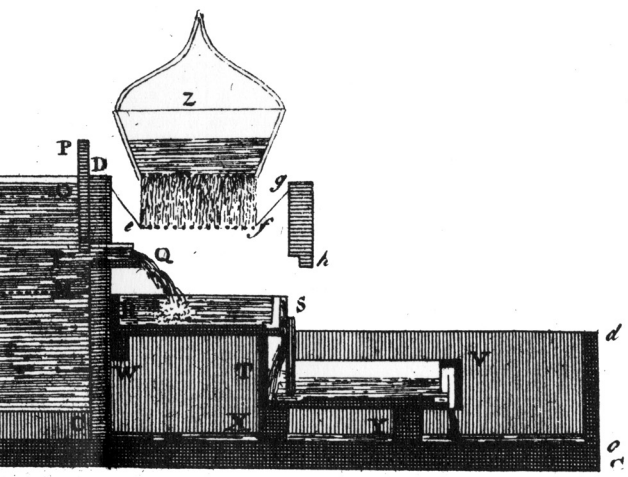


Fig. 1.



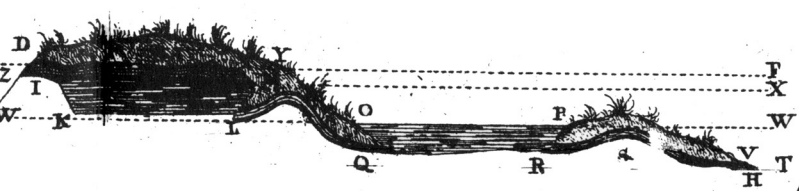
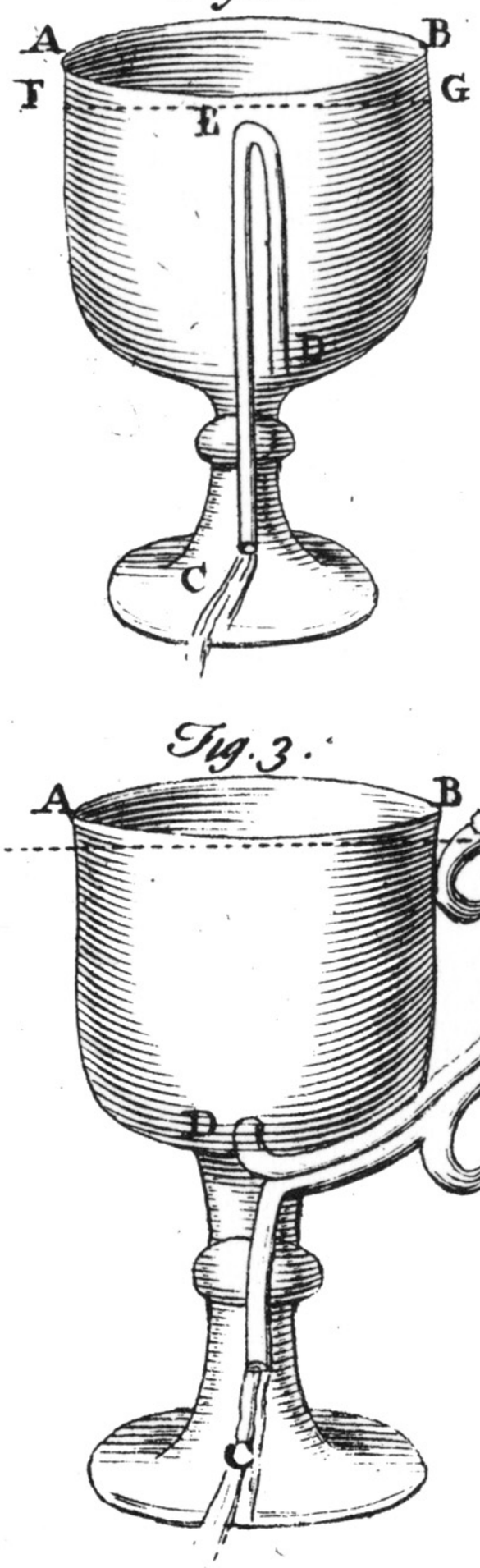


Fig. 1.



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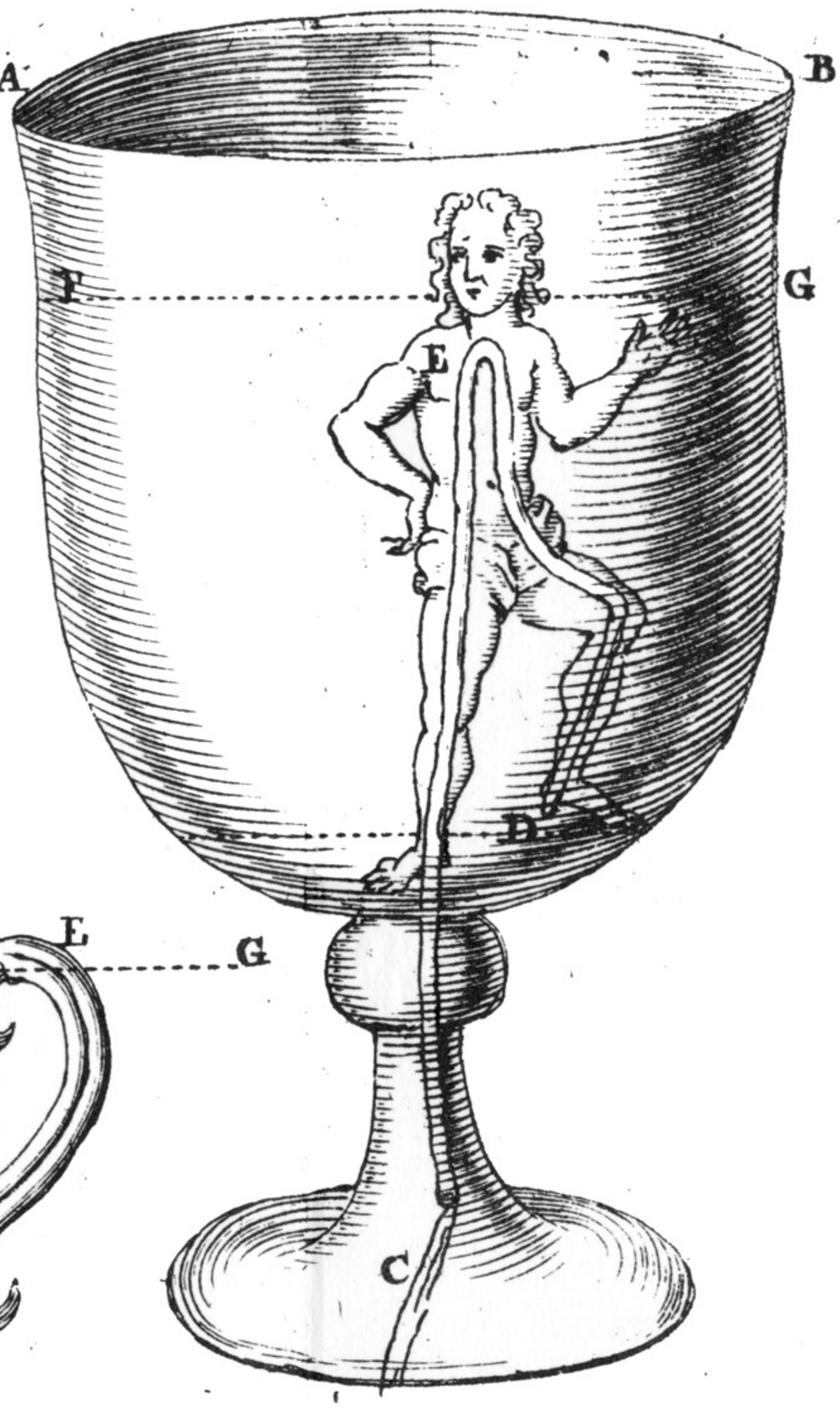

Fig. 3.

Fig. 4.

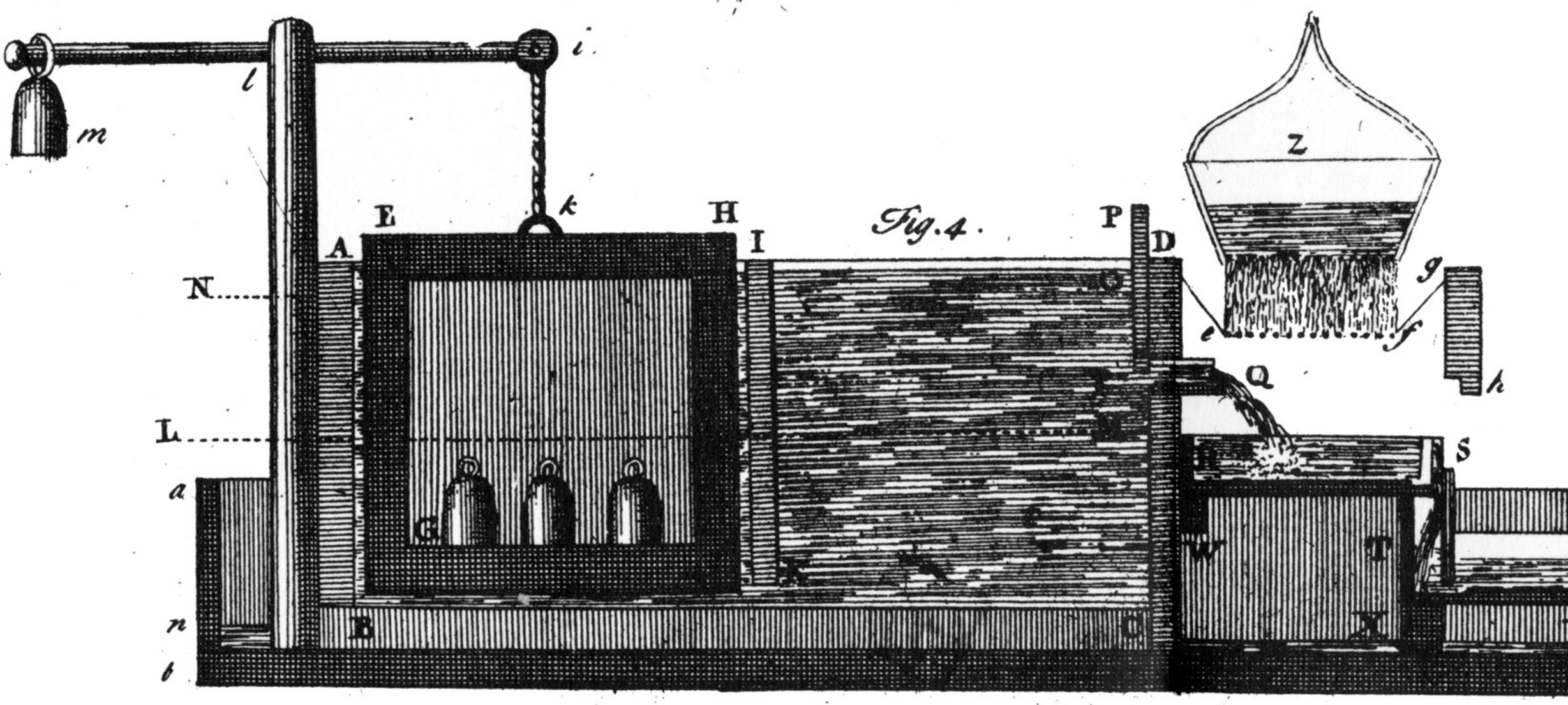

Fig. 5.